

Scope Date: November 2, 2012

SCOPE OF WORK

PROJECT NUMBERS: IM 0761-191
PROJECT CODES: 15402
CMS ID NUMBER:
PROJECT LOCATION: I-76 Phase III, Brush Colorado
CONTRACT TYPE: Project Specific
CONTRACT SUBJECT: Construction Management, Inspection and Testing Services

1. Administration & General Requirements

A. Administration

Active day-to-day administration and monitoring of this contract will be delegated to:

For CDOT: **IM 0761-191 I-76 Phase III**
Gale Siedenburger, P.E.
Project Engineer
3939 Riverside Parkway
Evans, CO 80620
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For Consultant: Name
Project Manager
Consulting Firm
Street Address
Anytown, CO 80###
Phone: (###)###-####
FAX: (###) ###-####
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B. General Requirements

This Scope of Work (SOW) has been carefully reviewed by the Department and reflects a plan of approach based on the known goals. The Consultant's analysis of the project goals, its evaluation of the work elements, and its formulation of the work plan, coupled with its understanding of and sensitivity to the key issues may produce new approaches or modifications to the project's work elements. Therefore, the Final Scope of Work for the project may change in some details to incorporate the Consultant's input. This work is located in Region Four of the Colorado Department of Transportation. This SOW includes all projects listed above. The Consultant shall provide staff for all projects. At the Resident Engineer's discretion Consultant personnel may be moved from one project to the other to cover work as needed.

C. Requirements for All On-Site Consultant Personnel

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise

directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each work day.

2. Definitions

CDOT Resident Engineer - The CDOT Resident Engineer is responsible to the Region Program Engineer for the quality and successful completion of a transportation project. The Resident Engineer authorizes interim and final payments and all changes to Contracts for all Consultants and Contractors

CDOT Project Engineer - The CDOT employee assigned by the Resident Engineer to be the Chief Engineer's duly authorized representative. The CDOT Project Engineer is in direct charge of the work and is responsible for the administration and satisfactory completion of the project under contract

Consultant - The firm or corporation providing personnel under this agreement to perform construction services as outlined herein

Consultant Professional Engineer - Consultant's Professional Engineer in responsible charge of Consultant services performed as described in this Contract. The Consultant's Professional Engineer must be licensed in the State of Colorado

Consultant Project Manager - The Consultant employee who administers the Consultant contract with CDOT. The Consultant Project Manager works under the responsible charge of the Consultant's Professional Engineer. The Consultant Project Manager, if a Professional Engineer licensed in the State of Colorado, may be the same person as the Consultant Professional Engineer

Consultant Inspector - Consultant employee who performs construction inspection services, and other project-related services under the responsible charge of the Consultant's Professional Engineer, at the direction of the CDOT Project Engineer

Consultant Inspector/Materials Testing Technician – A consultant employee who performs material testing duties as well as some limited construction inspection duties.

Consultant Materials Testing Technician (MTT) - Consultant employee who performs construction materials testing services, construction inspection, and other project-related services under the responsible charge of the Consultant's Professional Engineer, at the direction of the CDOT Project Engineer.

Contractor - The individual, firm, or corporation contracting with CDOT to construct a transportation project

3. General Requirements for Personnel, Vehicles, and Equipment

A. During construction CDOT anticipates utilizing the following personnel to perform the work. The Consultant shall furnish up to approximately:

- 1 Field Office Administrative Assistant
- 2 Consultant Inspector's Aides
- 2 Consultant Materials Testing Technicians

- 3 Consultant Junior Inspectors (4 of which have some bridge experience)
- 4 Consultant Senior Inspectors (4 of which that have significant bridge experience)
- 1 Consultant Office Engineers
- 1 Consultant Asst. Project Engineer (which have significant bridge experience)
- 1 Consultant CPM Schedule Expert

- B. All personal furnished by the Consultant shall have an appropriate vehicle, equipped with flashing amber beacon, all personal protective equipment, and a functional cellular phone in addition to specific equipment needs outlined in the qualifications section for each classification of personal provided by the consultant.
- C. Conditions Applicable to all Consultant Personnel: Overtime / Travel Pay / Commute Miles /Per Diem -Overtime hours will be paid by CDOT at the same rate as regular, non-overtime hours. Travel time in one direction will be paid. Commuting mileage (limited to 175 miles per day or actual one-way trip commuting distance, whichever is less), will be paid. In lieu of payment for Travel Time and Commuting mileage CDOT will pay per diem in accordance with State Fiscal Rules.

D. Labor, Materials, Vehicles & Equipment

The Consultant shall provide the following for their personal assigned to the project and as agreed to by the CDOT Project Engineer and the Consultant Assistant Project Engineer each employee will have access to the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible a minimum of five hundred (500) feet in normal sunlight.
- Consultant Project Manager's vehicle and all Consultant Inspectors' vehicles shall each be equipped with an electronic distance-measuring device, accurate to within +/- 5 feet per mile.
- A cellular phone as needed.
- Each with a state-of-the-art computer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. Each computer shall be loaded with MS Office software (2003 version or later), including MS Word and MS Excel at a minimum. Computers shall be capable of running current CDOT software, including Asphalt '03, Voids '03, Site Manager, etc. All computers shall be connected or networked to a Consultant-supplied project printer/scanner, as follows:
 - Consultant shall provide a main project printer/scanner capable of making 11x17 color prints and 11x17 black-and-white scans. This printer/scanner shall be configured and connected or networked to all consultant-supplied computers on the project (except Consultant Materials Testing Technician may have a separate, stand-alone printer). Consultant shall maintain this main printer/scanner with ink and paper in a serviceable condition for the duration of the project, at no additional cost to the project. Scans made by this main printer/scanner shall be available in PDF-format at all consultant-supplied project computers (except not required at Consultant MTT's computer).
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3), including all applicable manuals.
- CDOT will provide a field-office space.

4. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the Engineer. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Project Manager(s) and Consultant Inspectors permanently assigned to a project shall be competent in road and bridge construction and be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements including SiteManager. The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

- Administrative Assistant – General aptitude for office work with training to check payrolls. Office experience one (1) to two (2) years of experience.
- Consultant Inspector's Aides – one (1) to two (2) years of experience in highway construction inspection.
- Materials Testing Technician – two (2) or more years of experience in Materials testing and at least one (1) year of previous CDOT experience.
- Junior Level Inspector – four (4) to six (6) years of experience in highway construction inspection.
- Senior Level Inspector – more than six (6) years of experience in highway construction inspection.
- Office Engineer – two (2) to four (4) years of engineering experience, with some construction experience.
- Asst. Project Engineer – fifteen (15) or more years of experience in highway construction project management and supervision of consultant inspectors and testers. It is desirable that the Asst. Project Engineer has at least five years working on projects on the Interstate system.
- Consultant CPM Schedule Expert – ten (10) years of overall experience in highway construction, and a minimum of Three Major CDOT projects performed in accordance with 108.03 and a certified Planning & Scheduling Professional (AACE International PSP Certification).

A copy of work experience and proof of Certification and/or License shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the Consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

Personnel qualifications shall be subject to the approval of the CDOT Project Engineer. The Consultant shall assign personnel for the duration of the Contract, unless otherwise directed by the CDOT Project Engineer. Personnel shall have the following qualifications, or as approved by the CDOT Project Engineer:

A. Consultant Field Office Administrative Assistant Requirements

1. Project Standards

All work shall be done in accordance with accepted Professional Office Practices. All CDOT documentation shall be in accordance with the Colorado Department of Transportation Construction Manual, Field Materials Manual and other CDOT standards as applicable.

2. General Work Description

The Consultant Administrative Assistant shall be responsible for the day to day administrative duties as directed by the CDOT PE or the Consultant Assistant Project Engineer and will include but not be limited to: with oversight from the Consultant Assistant Project Engineer check contractor payrolls, monitor contractor payroll compliance, aid in the preparation of correspondence to the contractor, CDOT Staff, local agencies, prepare and transmit updates of construction activities to the CDOT Public Information Office and other CDOT departments as directed, log correspondence, record minutes of progress and other meetings, receive project documentation from the contractor, project filing as required, deliver documentation or material samples to specified locations as required. Perform additional duties as directed by CDOT PE or Consultant Assistant PE.

3. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant Field Office Administrative Assistant shall be thoroughly familiar with Professional Office Business practices, CDOT forms and documentation requirements. The Consultant Field Office Administrative Assistant shall be permanently assigned to the project for the duration of the project.

B. Consultant Inspector's Aide Requirements

1. Project Standards

All sampling, testing, inspection, and documentation shall be in accordance with the Colorado Department of Transportation (CDOT) Construction Manual and Field Materials Manual. The applicable CDOT Manual shall be the one currently in use when the construction project is advertised.

If the required method is not described in the CDOT Field Materials Manual, the required work shall be completed in accordance with:

- a) AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing (as revised and supplemented), or
- b) The ASTM Standards and Tentatives, in this order.

Proposed work procedures shall be coordinated with the CDOT Project Engineer or the Consultant Assistant Project Engineer prior to the start of work each day.

2. General Work Description

The Consultant Inspector's Aide shall be responsible for assisting the CDOT PE, Consultant Assistant Project Engineer, Consultant Inspectors or Testers as directed by the CDOT PE or the Consultant Assistant Project Engineer and will include but not be limited to: Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures, submit daily diary at the end of the working day, submit payment-documentation reports (Form 266's) at the end of the working day, monitor contractor payroll compliance, participate in weekly progress meetings with contractor, subcontractors, utilities and other interested parties as required, maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans, perform initial, follow-up, and final inspections of work in progress including interim and final measurements, notify the CDOT Project Engineer or Consultant Assistant Project Engineer of non-compliance with the contract plans and specifications, deliver material samples to designated laboratories or locations, and perform miscellaneous project-related duties as requested by the CDOT Project Engineer or Consultant Assistant Project Engineer.

3. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant Inspector's Aide shall be familiar with CDOT specifications, manuals, forms, and documentation requirements. The Consultant Inspector's Aide shall be permanently assigned to a project for the duration of the project and shall have the following qualifications:

The Consultant Inspector's Aide shall be familiar with CDOT specifications, manuals, forms, and documentation requirements.

A copy of work experience shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

4. Documentation

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each workday.

C. Consultant Materials Testing Technician Requirements

1. Project Standards

All sampling, testing, inspection, and documentation shall be in accordance with the Colorado Department of Transportation (CDOT) Construction Manual and Field Materials Manual. The applicable CDOT Manual shall be the one currently in use when the construction project is advertised.

If the required method is not described in the CDOT Field Materials Manual, the required work shall be completed in accordance with:

- a) AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing (as revised and supplemented), or
- b) The ASTM Standards and Tentatives, in this order.

Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

2. General Work Description

The Consultant MTT (Materials Testing Technician) shall sample, test, and document all materials incorporated into the project. This includes materials delivered to the project that are listed in the Summary of Approximate Quantities or referred to in the Design/Build Plans and Specifications. The number of tests required shall be in accordance with the Schedule in the Field Materials Manual. Additional quantities may be added by Contract Modification Order, or plan approximate quantities may be increased or decreased. The MTT, the Consultant Project Manager, and CDOT's Project Engineer will review project quantities on a weekly basis to ensure that sufficient tests have been performed for all material placed to date. The consultant shall also provide any other project-related services requested by the

CDOT Project Engineer.

Testing of materials that are specifically designated to be pre-inspected or pre-tested by this or any other Department of Transportation will remain the responsibility of CDOT. The MTT shall document and transport samples of any and all materials to the CDOT Region or Central Laboratory that are required to be tested by CDOT, regardless of pre-inspection or pre-testing responsibilities. The items and test frequencies of CDOT tested materials shall be in accordance with the column titled "Central Laboratory" in the Schedule in the Field Materials Manual.

3. Additional Labor, Materials, Vehicles & Equipment Required:

The Consultant shall furnish the Consultant Materials Testing Technician with the following:

- A state-of-the-art computer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. This computer shall be loaded with MS Office software (2003 version or later), including MS Word and MS Excel at a minimum. This computer shall be capable of running current CDOT software, including Asphalt '03, Voids '03, Site Manager, etc. This computer shall be connected or networked to the Consultant-supplied main project printer/scanner described above, or shall be provided with a separate stand-alone printer.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3) including all applicable manuals.
- CDOT will provide a Class II field laboratory and any required traffic control.

The following equipment shall be furnished along with the MTT for each project in sufficient quantity and in good working order (with current calibration) to ensure accurate performance of all work required in a timely manner:

- Nuclear Asphalt-Content Gauge;
- Nuclear Moisture/Density Gauge; (Calibrated according to CDOT requirements)
- Concrete air meter, slump cone, and other concrete testing equipment;
- Sieves for aggregates and soil gradations, including a full set of Half Height Sieves;
- Electronic scales;
- Asphalt & A/C sample containers and small tools;
- Proctor equipment for soil curves and one point tests;
- Atterburg, Rice value, and Sand Equivalent equipment;
- Sample drying equipment;
- Concrete cylinder molds which meet AASHTO requirements except that paper molds shall not be used, and plastic molds shall not be reused;
- Miscellaneous equipment for performing the required soils, asphalt and concrete tests.

4. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The MTT shall be thoroughly familiar with CDOT specification, manuals, forms, and documentation requirements. The MTT shall be permanently assigned to a project for the duration of the project and shall have the following qualifications:

- A degree in Engineering from a four year curriculum school or a *National Institute for Certification in Engineering Technology (NICET*)* Level II Certification in Construction

Materials Testing and Inspection for the types of work being performed, e.g. aggregates, asphalt, concrete, and soils.

- The MTT performing concrete tests shall be certified by *The American Concrete Institute (ACI)*. Field and Strength.
- The MTT performing hot bituminous pavement tests shall be Level II, A&B certified by *The Colorado Asphalt Technician Certification Program (LabCAT)*.
- WAQTC, Soils Certification/ Inspection.
- The MTT shall be thoroughly familiar with CDOT specification, manuals, forms, and documentation requirements.

* Or equivalent as agreed to by the CDOT Project Engineer.

A copy of work experience and proof of Certification, Degree, and/or License shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

5. Documentation

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each workday.

Test results and sample submittals transmitted to CDOT's Region or Central Laboratory shall be recorded on appropriate CDOT Forms. The MTT may use CDOT worksheets or worksheets approved by the CDOT Project Engineer. CDOT Forms and worksheets are available through the CDOT Project Engineer.

The MTT shall furnish the CDOT Project Engineer with original copies of all worksheets and test results on a daily basis. The MTT shall also keep the CDOT Form 626 up to date at all times and provide copies of this form to the CDOT Project Engineer within 12 hours. The CDOT Project Engineer shall be informed immediately of any non-specification material. At the discretion of the CDOT Project Engineer, the MTT may also be required to provide the CDOT Form 626 to the contractor within 12 hours for any non-specification material.

The MTT shall provide all correspondence and applicable CDOT forms to the CDOT Project Engineer or his authorized representative for review and signature.

6. Assurance Sampling and Testing

The MTT shall coordinate the schedule of the Independent Assurance Tests (IAT) for the project with the Region Materials Section in accordance with the CDOT Form 379. Advance notice of 48 hours is required for proper coordination.

7. Submittal of Final Documentation

Final documentation shall be submitted to the CDOT Project Engineer within 30 working days after completion of all work. A completed CDOT Form 250 shall be submitted to the

CDOT Project Engineer 10 days after the consultant has been notified of final quantities. Failure to submit final documentation as required will result in withholding of consultant payments. *Final Documentation work will be completed under a supplemental task order and is not to be completed in task order number one.*

D. Consultant Inspector Requirements

1. Project Standards

All construction inspection shall be in accordance with the Colorado Department of Transportation's Construction Manual, Field Materials Manual, Standard Specifications for Road & Bridge Construction, Project Standard Provisions, Project Special Provisions, and the plans and specifications in use when the project is advertised. All Consultant construction inspection activities shall be as authorized by the Engineer. For the purposes of this document, construction inspection shall be known as "the work" and references to "the specifications" shall include all applicable CDOT Standard Specifications for Road and Bridge Construction as amended by Project Standard Provisions, Project Special Provisions, and project plans and specifications.

2. General Work Description

The Consultant Project Manager and Consultant Project Inspectors shall provide support to the CDOT project staff through assignment of personnel to assist with project management and inspection responsibilities. Inspection responsibilities include:

Assist the CDOT Project Engineer in the following Construction activities:

- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Submit daily diary at the end of the working day;
- Submit payment-documentation reports (Form 266's) at the end of the working day;
- Prepare periodic reports and billings required by CDOT Procedural Directive 400.2;
- Monitor contractor payroll compliance;
- Participate in weekly progress meetings with contractor, subcontractors, utilities and other interested parties;
- Secure project documentation from the contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Review drawings and data submitted by the construction contractor and suppliers for conformance with the intent of the specifications;
- Obtain concurrence as needed from the CDOT Project Engineer and keep relative documentation for project records;
- Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- Communicate with adjacent landowners as required to resolve issues that arise due to construction;
- Monitor compliance with and take appropriate action to preserve safety on the project for all workers and traveling public in accordance with Method of Handling Traffic (MHT);
- Perform initial, follow-up, and final inspections of work in progress including interim and final measurements;
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- Perform special tests, investigations, or monitoring to fulfill the intent of the CDOT inspection program;

- Aid in the preparation of correspondence to the contractor, CDOT Staff, local agencies, etc.;
- Provide liaison and communication to contractor field crews;
- Prepare final "As-Constructed" plans upon project completion;
- Prepare punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Prepare responses to contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence;
- Prepare and transmit updates of construction activities to the CDOT Public Information Office;
- Deliver material samples to designated laboratories or locations;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

3. Personal Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the Engineer. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Project Manager(s) and Consultant Inspectors permanently assigned to a project shall be competent in road and bridge construction and be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements including SiteManager. The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

- a) Junior Level Inspector – four (4) to six (6) years of experience in highway construction inspection.
- b) Senior Level Inspector – more than six (6) years of experience in highway construction inspection.

The Consultant Inspectors shall either have a *National Institute for Certification in Engineering Technology (NICET*)* Certification Level III in Highway Construction or have an Engineer-In-Training (EIT) certification from the State of Colorado, unless otherwise approved by CDOT.

A copy of work experience and proof of Certification and/or License shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the Consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

* Or equivalent as agreed to by the CDOT Project Engineer.

4. Documentation

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each

workday.

E. Consultant Office Engineer Requirements

1. Project Standards

All construction documentation and engineering work will be in accordance with the Colorado Department of Transportation's Construction Manual, Field Materials Manual, Standard Specifications for Road & Bridge Construction, Project Standard Provisions, Project Special Provisions, and the plans and specifications in use when the project is advertised or any other applicable CDOT Manual. All Consultant Office Engineer activities shall be as authorized by the Engineer. For the purposes of this document, construction office engineering shall be known as "the work" and references to "the specifications" shall include all applicable CDOT Standard Specifications for Road and Bridge Construction as amended by Project Standard Provisions, Project Special Provisions, and project plans and specifications and any other applicable CDOT Manual.

2. General Work Description

The Consultant Office Engineer shall provide support to the CDOT PE and Consultant project staff through assignment of personnel to assist with project management, administrative duties, engineering duties and inspection responsibilities as directed by the CDOT PE or Consultant Assistant Project Engineer. Office Engineer responsibilities include but are not limited to the following:

Assist the CDOT Project Engineer in the following Construction activities:

- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Submit daily diary at the end of the working day;
- Submit payment-documentation reports (Form 266's) at the end of the working day;
- Prepare periodic reports and billings required by CDOT Procedural Directive 400.2;
- Monitor contractor payroll compliance;
- Participate in weekly progress meetings with contractor, subcontractors, utilities and other interested parties;
- Secure project documentation from the contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Review drawings and data submitted by the construction contractor and suppliers for conformance with the intent of the specifications;
- Obtain concurrence as needed from the CDOT Project Engineer and keep relative documentation for project records;
- Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- Communicate with adjacent landowners as required to resolve issues that arise due to construction;
- Monitor compliance with and take appropriate action to preserve safety on the project for all workers and traveling public in accordance with Method of Handling Traffic (MHT);
- Perform initial, follow-up, and final inspections of work in progress including interim and final measurements;
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- Perform special tests, investigations, or monitoring to fulfill the intent of the CDOT inspection program;

- Aid in the preparation of correspondence to the contractor, CDOT Staff, local agencies, etc.;
- Provide liaison and communication to contractor field crews;
- Prepare final "As-Constructed" plans upon project completion;
- Prepare punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Prepare responses to contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence;
- Prepare and transmit updates of construction activities to the CDOT Public Information Office;
- Deliver material samples to designated laboratories or locations;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.
- Perform Force Account Analysis
- Coordinate RFI's with Project Design Support
- Provide liason and communication with CDOT R4 Specialty Units.
- Provide Engineering Support to the project as directed by CDOT PE or Consultant Assistant Project Engineer
- Other duties as directed by CDOT PE or Consultant Assistant Project Engineer

3. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the Engineer. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Project Manager(s) and Consultant Inspectors permanently assigned to a project shall be competent in road and bridge construction and be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements including SiteManager. The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

Consultant Office Engineer – two (2) to three (3) years of engineering experience in highway design and construction.

The Consultant's Office Engineer shall possess either an EIT certification from the State of Colorado, or be licensed as a Professional Engineer in the State of Colorado, unless otherwise approved by CDOT.

A copy of work experience and proof of Certification and/or License shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the Consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

4. Documentation

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and

sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each workday.

F. Consultant Assistant Project Engineer Requirements

1. Project Standards

All construction inspection shall be in accordance with the Colorado Department of Transportation's Construction Manual, Field Materials Manual, Standard Specifications for Road & Bridge Construction, Project Standard Provisions, Project Special Provisions, and the plans and specifications in use when the project is advertised. All Consultant construction inspection activities shall be as authorized by the Engineer. For the purposes of this document, construction inspection shall be known as "the work" and references to "the specifications" shall include all applicable CDOT Standard Specifications for Road and Bridge Construction as amended by Project Standard Provisions, Project Special Provisions, and project plans and specifications.

2. General Work Description

The Consultant Project Manager and Consultant Project Inspectors shall provide support to the CDOT project staff through assignment of personnel to assist with project management and inspection responsibilities. Inspection responsibilities include:

Assist the CDOT Project Engineer in the following Construction activities:

- Manage day to day activities and work assignments of consultant project staff as agreed by the CDOT Project Engineer.
- Report project status, needs and issues to CDOT Project Engineer daily.
- Implement project document management plan/system in accordance with relevant CDOT manuals.
- Oversee project document management plan/system compliance.
- Assign contractor RFI's to Office Engineers for coordination with the designer or CDOT Specialty Units as required.
- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Submit daily diary at the end of the working day;
- Submit payment-documentation reports (Form 266's) at the end of the working day;
- Prepare periodic reports and billings required by CDOT Procedural Directive 400.2;
- Monitor contractor payroll compliance;
- Participate in weekly progress meetings with contractor, subcontractors, utilities and other interested parties;
- Secure project documentation from the contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Review drawings and data submitted by the construction contractor and suppliers for conformance with the intent of the specifications;
- Obtain concurrence as needed from the CDOT Project Engineer and keep relative documentation for project records;
- Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- Communicate with adjacent landowners as required to resolve issues that arise due to construction;

- Monitor compliance with and take appropriate action to preserve safety on the project for all workers and traveling public in accordance with Method of Handling Traffic (MHT);
- Perform initial, follow-up, and final inspections of work in progress including interim and final measurements;
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- Perform special tests, investigations, or monitoring to fulfill the intent of the CDOT inspection program;
- Aid in the preparation of correspondence to the contractor, CDOT Staff, local agencies, etc.;
- Provide liaison and communication to contractor field crews;
- Prepare final "As-Constructed" plans upon project completion;
- Prepare punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Prepare responses to contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence;
- Prepare and transmit updates of construction activities to the CDOT Public Information Office;
- Deliver material samples to designated laboratories or locations;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

3. Personnel Qualifications

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the Engineer. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Project Manager(s) and Consultant Inspectors permanently assigned to a project shall be competent in road and bridge construction and be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements including SiteManager. The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

- Junior Level Inspector – four (4) to six (6) years of experience in highway construction inspection.
- Senior Level Inspector – more than six (6) years of experience in highway construction inspection.

The Consultant Inspectors shall either have a *National Institute for Certification in Engineering Technology (NICET*)* Certification Level III in Highway Construction or have an Engineer-In-Training (EIT) certification from the State of Colorado, unless otherwise approved by CDOT.

A copy of work experience and proof of Certification and/or License shall be provided to the CDOT Project Engineer before work begins. Personnel provided by the Consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by the CDOT Project Engineer.

* Or equivalent as agreed to by the CDOT Project Engineer.

4. Documentation

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each workday.

G. **Consultant CPM Schedule Expert:**

1. Project Standards

All scheduling and schedule review will be done in accordance with the Construction Contract, the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, the Colorado Department of Transportation (CDOT) Construction Manual and Field Materials Manual and industry norms and standards. The applicable CDOT Manual shall be the one currently in use when the construction project is advertised.

Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

2. General Work Description

The Consultant CPM Schedule Expert shall be responsible for analyzing the contractors schedule in accordance with the requirements of the construction contract on CDOT's behalf. The Contractor's progress schedule along with the weekly three week "look ahead" schedule will be reviewed on a weekly basis. In addition the Consultant CPM Schedule Expert will provide scheduling support to the project and the CDOT PE as needed. At a minimum the Consultant CPM Schedule Expert will be expected to:

- a) Review the Contractor's accepted as-planned schedule, schedule updates and method statements for compliance with contract requirements.
- b) Attend work session with contractor to develop a Baseline Project schedule if needed
- c) Initial schedule review including durations, logic, sequencing, and methods statements. Provide written comments and recommendation to Project Engineer.
- d) Review complete project schedule submitted by contractor and provide written comments and recommendation to Project Engineer.
- e) Re-review complete project baseline schedule. Provide written comments and recommendation to Project Engineer.
- f) Review proposed activities, durations, and logic resulting from changes for the purposes of establishing a new baseline schedule.
- g) Review monthly project schedule updates
- h) Assemble and review as-built data and review as-built schedules.
- i) Provide ongoing schedule review and evaluation support through project completion.

3. Qualifications

The Consultant CPM Schedule Expert shall be permanently assigned to the project for the duration of the project and shall have the following qualifications:

The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level shall be commensurate to experience, and are as follows:

Consultant CPM Schedule Expert – ten (10) years of overall experience in highway construction, and a minimum of Three Major DOT projects performed in accordance with 108.03 and a certified Planning & Scheduling Professional (AACE International PSP Certification).

4. **Additional Software & Equipment Required:**

The following equipment shall be furnished along with the Consultant CPM Schedule Expert for each project in sufficient quantity and in good working order:

- A cellular phone.
- A state-of-the-art computer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. This computer shall be loaded with MS Office software (2003 version or later), including MS Word and MS Excel at a minimum, the latest version of MicroSoft Project and Primavera Professional Project Management Software. This computer shall be also be capable of running Micro-Station and Inroads. This computer shall be connected or networked to the Consultant-supplied main project printer/scanner described above, or shall be provided with a separate stand-alone printer.

H. **Additional Construction Inspection and Materials Testing Requirements:**

In addition to the qualifications, requirements set forth above, the following certifications will also be required*:

| Class/Certification | Consultant Assistant Project Engineer | Consultant Inspector | Consultant Inspector's Aide | Consultant Materials Testing Technician |
|---|---------------------------------------|----------------------|-----------------------------|---|
| Basic Highway Math | X * | X | X | X |
| Basic Construction Surveying | X * | X | X | X |
| Basic Highway Plan Reading | X * | X | X | X |
| Storm water Management and Erosion Control | X | X | | |
| CCA Traffic Control Supervisor | X | X | | |
| Concrete Transportation Construction Inspection | X | X | | |
| SPECIALTY CERTIFICATIONS | | | | |
| NICET** Level IV in Highway Construction | X | | | |
| NICET** Level III in Highway Construction | | X | | |
| NICET** Level II in Construction Materials | | | | X |

| | | | | |
|---|--|------------|--|-------------|
| Testing & Inspection | | | | |
| Colorado Asphalt Technician Certification LabCAT (Level C includes Volumetrics) | | Level A ,B | | Level A,B,C |
| Asphalt Paving Inspection LabCAT Level I | | X | | X |
| WAQTC Soils Certification | | X | | X |
| ACI Field Testing Grade I (including: casting concrete cylinders) | | | | X |
| ACI Field Strength Testing Grade I, <u>or</u> : ACI Lab Testing Technician Level I (including: breaking concrete beams and cylinders) | | | | X |

* Not required if the Consultant Project Manager or Assistant Project Manager is a licensed Professional Engineer.

** Or equivalent as agreed to by the CDOT Project Engineer.

Each Consultant Inspector shall be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements. Consultant personnel who do not meet these qualifications, or who fail to perform their work in an acceptable manner, shall be removed from the project upon request by the CDOT Project Engineer.

5. **General Work Description**

The Consultant Inspectors shall inspect or sample and document specific materials and products or methods utilized in the construction of the project. The Consultant inspector shall also perform construction inspection documentation and such other project-related tasks as may be directed by the CDOT Project Engineer. The Consultant Materials Testing Technician shall perform all testing requirements per CDOT specifications. The Consultant Materials Testing Technician shall also perform other project-related tasks as may be directed by the CDOT Project Engineer.

6. **Project Re-Start Meeting**

The consultant personnel and CDOT project personnel shall meet to coordinate and schedule the required work. The Consultant shall complete all work in accordance with the approved schedule, or as directed by the CDOT Project Engineer.

7. **Work Duration**

Anticipated Construction: February, 2013 to June, 2015.

The time for the work described in this scope of work covers the period from Notice to Proceed to June 30, 2015 or 90 days after Final Acceptance of the construction project, whichever is later. For portions of the project, night work will be required. Work will also be required during the day, on

weekends, holidays, and/or on a split-shift basis. Work weeks may be in excess of or less than the standard 40-hour week.

8. Location of Work

Principally on I-76 from MP 84 to MP 93 or at other locations as directed by the CDOT Project Engineer or Consultant Assistant Project Engineer.

9. Authorization to Proceed

Work shall not commence until the written notice to proceed is received by the Consultant. The work shall be completed in the time specified.

10. Routine Billing & Reporting

The Consultant shall provide the following on a routine basis:

- a) Coordination of all contract activities by the Consultant's Project Manager;
- b) Monthly billings, in a format suitable to the CDOT Project Engineer, for all contract activities performed by the Consultant personnel;
- c) Periodic reports and billings required by CDOT Procedural Directive 400.2;
- d) Payment Schedule Updates (see below).

11. Payment Schedule

The Consultant shall prepare a payment schedule which shall show the dollar amount of work the Consultant expects to complete by the progress estimate date each month for the duration of work. The schedule shall cover the period from the commencement of work to the expected completion date as shown on the Consultant's progress schedule. The payment schedule shall be prepared using standard spreadsheet software such as MS Excel and shall be submitted in electronic format, with an accompanying printed hard copy. The CDOT Project Engineer will provide the spreadsheet format.

A. *Initial Payment Schedule.* The Consultant shall submit the initial payment schedule at the project Re-Start meeting. The payment schedule shall consist of two parts: (1) a tabulation, and (2) a bar chart.

- 1) *Part 1.* Part 1 shall be a tabulation which shows:
 - the salient features listed in the Consultant's progress schedule
 - the dollar amount of work in each salient feature expected to be completed by each month's progress estimate date
 - the dollar amount of all other work not included in the salient features expected to be completed by each month's progress estimate date
 - the total dollar amount of work expected to be completed by each month's Progress estimate date

- 2) *Part 2.* Part 2 shall be a bar chart, which shows the expected total dollar amount of work to be completed by each month's progress estimate date.

B. *Payment Schedule Updates.* Once each month the Consultant shall submit a payment schedule update to the CDOT Project Engineer. The schedule update shall be in the same two-

part format as the initial schedule and shall be submitted to the CDOT Project Engineer by the first day of each month. In each payment schedule update, estimated monthly dollar amounts shall be revised to match actual progress payments made to the Consultant to date. Each payment schedule update shall show corrected dollar amounts of work to be completed each month through the expected completion date as shown on the Consultant's progress schedule.

- C. Failure to Submit Payment Schedule. If the Consultant fails to submit the initial payment schedule or a payment schedule update by the required date, the CDOT Project Engineer will withhold further progress payments until such time as the Consultant has submitted a current payment schedule.

12. Status of Contract

The Consultant shall monitor the status of the contract and advise the CDOT Resident Engineer of any potential need to supplement the contract. Failure to monitor contract status and provide timely notification may result in discontinuation of the Consultant's services.

13. Project Standards

Work procedures will be coordinated by the CDOT Project Engineer prior to the start of work, and as the work proceeds.

All sampling, testing, inspection and documentation shall be in accordance with the *CDOT Construction Manual* and *CDOT Field Materials Manual*. The applicable *CDOT Field Materials Manual* shall be the one currently in use when the construction project is advertised. If the required method is not described in the *CDOT Field Materials Manual*, the required work shall be completed in accordance with:

- a) *AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing* (as revised and supplemented), or
- b) *The ASTM Standards and Tentatives*, in that order.

All construction inspection shall be in accordance with the latest versions of the *CDOT Construction Manual* and applicable *Inspector's Checklist*, *Standard Specifications for Road and Bridge Construction*, applicable *M & S Standards*, and the plans and specifications in use when the construction project is advertised or revised under advertisement.

14. Materials and Equipment:

CDOT will provide a field office and field laboratory Class – 2 and any required traffic control.

The Consultant shall furnish the following equipment, in sufficient quantity and in good working order, to ensure accurate performance of all work required in a timely manner:

- Cellular phone;
- Computer with printer and standard MS Office software (including MS Word and Excel) for running CDOT SiteManager program and current Materials programs (for example, Voids, etc.);
- Miscellaneous equipment to include calculator, office supplies, and personal safety equipment;
- Manuals necessary for the completion of assigned tasks, including at a minimum, current editions of: *CDOT Standard Specifications for Road and Bridge Construction*, *CDOT Construction Manual*, *CDOT M & S Standards*, *CDOT Field Materials Manual*;
- Additional manuals appropriate to the inspection and testing duties may be required and shall

be provided immediately by Consultant upon request by the CDOT Project Engineer.

15. Specific Inspection Requirements

The Consultant Inspectors shall assist the CDOT Project Engineer in performance of construction inspection activities and other project-related activities, as directed by the CDOT Project Engineer. Inspection responsibilities may include but are not limited to the following:

- Periodic reports and billings;
- Participation in weekly progress meetings with contractor, subs, utilities, and other interested parties;
- Anticipating project problems and suggesting solutions to the CDOT Project Engineer;
- Monitoring compliance with and taking appropriate action to preserve safety on the project for all workers and traveling public in accordance with Method of Handling Traffic and the Manual of Uniform Traffic Control Devices;
- Initial, follow-up, completion, and final inspections of work in progress, including interim and final measurements;
- Notifying contractor and Engineer of non-compliance with the contract plans and specifications;
- Performance of special tests, investigations, or monitoring which are required to fulfill the intent of the CDOT inspection program;
- Preparation of inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Submittal of standard documentation reports no later than the following working day;
- Preparation of routine correspondence to the contractor, CDOT Staff, local agencies, etc.;
- Providing liaison and communication to contractor field crews;
- Assist in preparing punch lists of uncompleted work, non-conformance reports, and deficiency notices.
- Maintaining accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- Miscellaneous project-related duties as directed by the CDOT Project Engineer;
- Maintaining all Inspection records and documentation in three ring binders to remain on the project for inspection by CDOT at any time.

16. Documentation

Each of the Consultant's project personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT Form 103, Project Diary, or a form approved by the CDOT Project Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. Each Consultant Inspector shall give a copy of his/her daily diary to the CDOT Project Engineer within one working day of its date.

Test results and sample submittals transmitted to CDOT's Region or Central Laboratory shall be recorded on appropriate CDOT Forms. The Consultant Inspector may use CDOT worksheets or worksheets approved by the CDOT Project Engineer. CDOT Forms and worksheets are available through the CDOT Project Engineer.

The Consultant Inspectors shall furnish the CDOT Project Engineer with original copies of all worksheets and test results on a daily basis. The CDOT Project Engineer shall be informed immediately of any non-specification material.

The Consultant Inspectors shall provide all correspondence and applicable CDOT forms to the

CDOT Project Engineer or his authorized representative for review and signature.

17. Submittal of Final Documentation:

Final documentation shall be submitted to the CDOT Project Engineer within 30 working days after completion of all work. Failure to submit final documentation as required will result in withholding of Consultant payments.